

Appendix to “On the Relationship between Gross Output-based TFP Growth and Value Added-based TFP Growth: An Illustration Using Data from Australian Industries”

Appendix Table 1

Magnification Factors, Gross Output-Based TFP relative to Value Added-Based TFP in Australian Industries, Paasche Index Number Framework, 2011-12

Industry	TFP Growth Rates		Magnification Factor	Components of Magnification Factor		Error of Primary Cost Share Approximation (%)
	Gross Output-Based (%)	Value Added-Based (%)	Ratio of Gross Output-based to Value Added-based TFP Growth Rates	Cost Share of Primary Inputs in Total Input Costs 2011	Ratio of Growth Factor of Primary Inputs to Growth Factor of All Inputs	
	(1)	(2)	$\frac{(3)=(1)}{(2)=(4) \cdot (5)}$	(4)	(5)	(6) = $100 \cdot \frac{(4)}{(3)-1}$
A Agriculture, Forestry and Fishing	0.08	0.19	0.41	0.41	1.00	-0.03
B Mining	-2.29	-4.46	0.513	0.53	0.97	3.26
C Manufacturing	-0.18	-0.63	0.282	0.28	1.01	-0.55
D Electricity, Gas, Water and Waste Services	0.43	0.89	0.482	0.48	1.01	-0.50
E Construction	0.54	1.71	0.313	0.31	1.01	-0.84
F Wholesale Trade	-0.13	-0.27	0.469	0.48	0.98	2.33
G Retail Trade	2.39	4.13	0.579	0.59	0.98	1.96
H Accommodation and Food Services	-0.49	-1.00	0.488	0.49	1.00	0.31
I Transport, Postal and Warehousing	0.49	1.13	0.437	0.44	0.99	0.59
J Information, Media and Telecommunications	-1.69	-3.61	0.469	0.46	1.02	-1.97
K Financial and Insurance Services	2.78	4.45	0.623	0.62	1.00	-0.47
L Rental, Hiring and Real Estate Services	2.08	4.32	0.481	0.49	0.98	1.81
M Professional, Scientific and Technical Services	0.77	1.50	0.515	0.52	0.99	1.01
N Administrative and Support Services	2.02	3.78	0.536	0.54	0.99	0.80
R Arts and Recreation Services	-0.51	-1.36	0.378	0.38	0.99	0.57
S Other Services	-1.93	-3.69	0.522	0.52	1.00	-0.43

Source: Author's calculations using data from the Australian Bureau of Statistics Estimates of Industry Multifactor Productivity.

Appendix Table 2

Magnification Factors, Gross Output-Based TFP relative to Value Added-Based TFP in Australian Industries, Fisher Index Number Framework, 2011-12

Industry	Direct Calculation of Magnification Factor	Simple Approximation (w=1/2)	Complex Approximation	Weight on Laspeyres Complex Approximation (w)	Errors of Simple Approximation (%)	Error of Complex Approximation (%)
A Agriculture, Forestry and Fishing	0.410	0.410	0.410	0.500	0.00	0.00
B Mining	0.558	0.552	0.558	0.570	-1.07	-0.02
C Manufacturing	0.281	0.281	0.281	0.500	0.00	0.00
D Electricity, Gas, Water and Waste Services	0.474	0.474	0.474	0.484	-0.06	0.00
E Construction	0.308	0.308	0.308	0.491	-0.03	0.00
F Wholesale Trade	0.475	0.475	0.475	0.514	-0.04	0.00
G Retail Trade	0.580	0.580	0.580	0.501	0.00	0.00
H Accommodation and Food Services	0.486	0.486	0.486	0.495	0.00	0.00
I Transport, Postal and Warehousing	0.444	0.444	0.444	0.500	0.00	0.00
J Information, Media and Telecommunications	0.459	0.459	0.459	0.500	0.00	0.00
K Financial and Insurance Services	0.620	0.620	0.620	0.498	0.00	0.00
L Rental, Hiring and Real Estate Services	0.485	0.485	0.485	0.500	0.00	0.00
M Professional, Scientific and Technical Services	0.513	0.513	0.513	0.502	0.00	0.00
N Administrative and Support Services	0.540	0.540	0.540	0.501	0.00	0.00
R Arts and Recreation Services	0.387	0.386	0.387	0.517	-0.08	0.00
S Other Services	0.530	0.530	0.530	0.506	-0.02	0.00

Source: Author's calculations using data from the Australian Bureau of Statistics Estimates of Industry Multifactor Productivity.

Appendix Table 3

Comparison of Magnification Factors, Gross Output-Based TFP relative to Value Added-Based TFP, Australia, 2011-12

Industry	Official ABS Estimates	Laspeyres	Paasche	Fisher
A Agriculture, Forestry and Fishing	0.400	0.409	0.410	0.410
B Mining	0.528	0.597	0.513	0.558
C Manufacturing	0.287	0.280	0.282	0.281
D Electricity, Gas, Water and Waste Services	0.475	0.465	0.482	0.474
E Construction	0.308	0.304	0.313	0.308
F Wholesale Trade	0.438	0.482	0.469	0.475
G Retail Trade	0.584	0.582	0.579	0.580
H Accommodation and Food Services	0.488	0.484	0.488	0.486
I Transport, Postal and Warehousing	0.447	0.450	0.437	0.444
J Information, Media and Telecommunications	0.448	0.450	0.469	0.459
K Financial and Insurance Services	0.621	0.617	0.623	0.620
L Rental, Hiring and Real Estate Services	0.486	0.488	0.481	0.485
M Professional, Scientific and Technical Services	0.517	0.511	0.515	0.513
N Administrative and Support Services	0.542	0.545	0.536	0.540
R Arts and Recreation Services	0.386	0.395	0.978	0.987
S Other Services	0.533	0.537	0.522	0.530

Source: Author's calculations using data from the Australian Bureau of Statistics Estimates of Industry Multifactor Productivity

Appendix Table 4

Magnification Factors, Gross Output-Based TFP relative to Value Added-Based TFP in Australian Industries, Paasche Index Number Framework, 1994-12

Industry	TFP Growth Rates		Magnification Factor	Components of Magnification Factor		Error of Primary Cost Share Approximation (%)
	Gross Output-Based (%)	Value Added-Based (%)	Ratio of Gross Output-based to Value Added-based TFP Growth Rates	Cost Share of Primary Inputs in Total Input Costs 2011	Ratio of Growth Factor of Primary Inputs to Growth Factor of All Inputs	
	(1)	(2)	$\frac{(3)=(1)}{(2)=(4) \times (5)}$	(4)	(5)	(6) = $100 \times \frac{(4)}{(3)-1}$
A Agriculture, Forestry and Fishing	30.89	104.34	0.296	0.41	0.72	38.48
B Mining	-17.10	-37.82	0.452	0.53	0.85	17.20
C Manufacturing	2.02	6.67	0.303	0.28	1.08	-7.66
D Electricity, Gas, Water and Waste Services	-15.22	-33.10	0.460	0.48	0.96	4.42
E Construction	11.55	39.43	0.293	0.31	0.94	5.88
F Wholesale Trade	23.22	43.14	0.538	0.48	1.12	-10.81
G Retail Trade	17.74	38.91	0.456	0.59	0.77	29.38
H Accommodation and Food Services	9.61	19.51	0.493	0.49	1.01	-0.54
I Transport, Postal and Warehousing	9.63	24.95	0.386	0.44	0.88	14.05
J Information, Media and Telecommunications	0.64	1.29	0.492	0.46	1.07	-6.53
K Financial and Insurance Services	27.24	44.78	0.608	0.62	0.98	1.92
L Rental, Hiring and Real Estate Services	-20.53	-43.44	0.473	0.49	0.96	3.66
M Professional, Scientific and Technical Services	7.75	15.06	0.515	0.52	0.99	1.06
N Administrative and Support Services	-1.64	-2.58	0.635	0.54	1.18	-14.92
R Arts and Recreation Services	-1.40	-3.92	0.358	0.38	0.94	6.10
S Other Services	-0.26	-0.50	0.524	0.52	1.01	-0.79

Appendix Table 5

Magnification Factors, Gross Output-Based TFP relative to Value Added-Based TFP in Australian Industries, Fisher Index Number Framework, 1994-12

Industry	Direct Calculation	Simple Approximation (w=1/2)	Complex Approximation	Weight on Laspeyres Complex Approximation (w)	Errors of Simple Approximation (%)	Error of Complex Approximation (%)
A Agriculture, Forestry and Fishing	0.304	0.304	0.304	0.477	0.02	-0.11
B Mining	0.607	0.560	0.600	0.639	-7.68	-1.13
C Manufacturing	0.293	0.293	0.293	0.506	0.04	-0.01
D Electricity, Gas, Water and Waste Services	0.581	0.552	0.577	0.608	-4.89	-0.56
E Construction	0.276	0.275	0.276	0.466	-0.40	0.02
F Wholesale Trade	0.461	0.448	0.462	0.413	-2.66	0.25
G Retail Trade	0.479	0.478	0.480	0.529	-0.26	0.03
H Accommodation and Food Services	0.429	0.419	0.429	0.423	-2.21	0.09
I Transport, Postal and Warehousing	0.393	0.393	0.393	0.500	0.00	0.00
J Information, Media and Telecommunications	1.187	0.433	1.112	-2.026	-63.57	-6.33
K Financial and Insurance Services	0.575	0.573	0.575	0.471	-0.30	0.04
L Rental, Hiring and Real Estate Services	0.526	0.520	0.525	0.548	-1.09	-0.13
M Professional, Scientific and Technical Services	0.441	0.432	0.442	0.431	-2.17	0.06
N Administrative and Support Services	0.346	0.438	0.361	0.844	26.65	4.41
R Arts and Recreation Services	0.375	0.374	0.375	0.525	-0.22	0.00
S Other Services	0.470	0.477	0.470	0.577	1.41	0.02

Source: Author's calculations using data from the Australian Bureau of Statistics Estimates of Industry Multifactor Productivity

Appendix Table 6

Comparison of Magnification Factors, Gross Output-Based TFP relative to Value Added-Based TFP, Australia, 1994-12

Industry	Official ABS Estimates	Laspeyres	Paasche	Fisher
A Agriculture, Forestry and Fishing	0.318	0.313	0.296	0.304
B Mining	0.640	0.737	0.452	0.607
C Manufacturing	0.310	0.283	0.303	0.293
D Electricity, Gas, Water and Waste Services	0.524	0.691	0.460	0.581
E Construction	0.286	0.259	0.293	0.276
F Wholesale Trade	0.453	0.384	0.538	0.461
G Retail Trade	0.493	0.503	0.456	0.479
H Accommodation and Food Services	0.401	0.365	0.493	0.429
I Transport, Postal and Warehousing	0.383	0.400	0.386	0.393
J Information, Media and Telecommunications	0.743	0.386	0.492	1.187
K Financial and Insurance Services	0.557	0.542	0.608	0.575
L Rental, Hiring and Real Estate Services	0.517	0.578	0.473	0.526
M Professional, Scientific and Technical Services	0.431	0.372	0.515	0.441
N Administrative and Support Services	0.293	0.334	0.635	0.346
R Arts and Recreation Services	0.335	0.391	0.358	0.375
S Other Services	0.098	0.437	0.524	0.470

Source: Author's calculations using data from the Australian Bureau of Statistics Estimates of Industry Multifactor Productivity